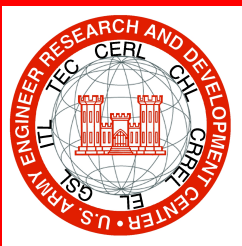


# Micro PAVER 5.1



## *New Dimensions in Pavement Maintenance Management*



**Construction Engineering Research Laboratory**

## Background

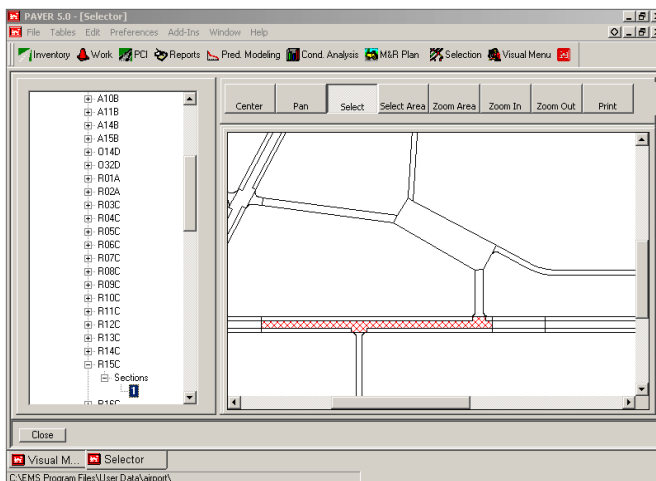
Micro PAVER is a Pavement Management System developed by the US Army Corps of Engineers, Champaign, IL. Micro PAVER aids pavement managers in deciding when and where to appropriate funds for pavement maintenance and rehabilitation.

Micro PAVER provides pavement management capabilities to: 1) develop and organize the pavement inventory; 2) assess the current condition of pavements; 3) develop models to predict future conditions; 4) report on past and future pavement performance; and 5) develop scenarios for pavement maintenance based on budget or condition requirements.

First released in 1981, Micro PAVER development is supported by the following agencies: US Air Force, US Army, US Navy, Federal Aviation Administration, and Federal Highway Administration. The newest release of Micro PAVER, Version 5.1, represents the efforts of all supporting agencies.

## Selection tools

Micro PAVER 5.1 offers an improved user interface. New tools have been added to assist users in selecting pavement sections. Internal GIS-based selection has been added along with a “Windows Explorer-like” tree selection tool. A pull-down menu selection tool and a tab selection tool also have been added, figure 1.



**Fig. 1:** New GIS and tree based selection tools provide additional methods for selecting inventory items throughout Micro PAVER. For example, inventory and inspection screens will display the selected pavement section for data viewing or editing.

## Inventory

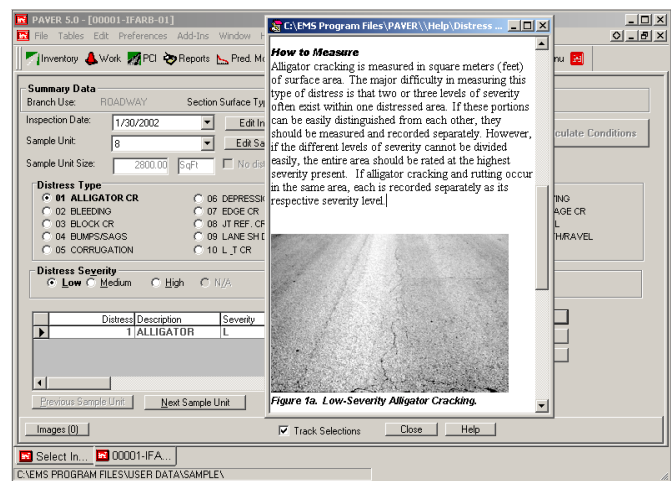
Micro PAVER inventory management is based on a hierarchical structure composed of networks, branches, and sections, with the section being the smallest managed unit. This structure allows users to easily organize their inventory while providing numerous fields and levels for storing pavement characteristics.

A new Copy and Move feature in Version 5.1 simplifies the process of splitting existing sections and applying work information to multiple sections at once.

## Inspection

To assess pavement condition, Micro PAVER uses the Pavement Condition Index (PCI) as its primary standard. The PCI measures pavement condition on a scale from 0 to 100. ASTM standard practices exist for the PCI for roads (D6433) and airfields (D5490). Micro PAVER provides users an interface for recording the results of an inspection, and Version 5.1 provides an online distress user guide, figure 2. Version 5.1 also allows the user to customize the PCI condition rating categories, figure 3.

In addition to the PCI, Version 5.1 allows managers to use and create other condition indices, including those based on PCI distresses. A new interface has been added for easily importing inspection data from automated vehicle collection sources.



**Fig. 2:** The online distress user guide can be opened within Micro PAVER by right-clicking the distresses in the PCI inspection form.

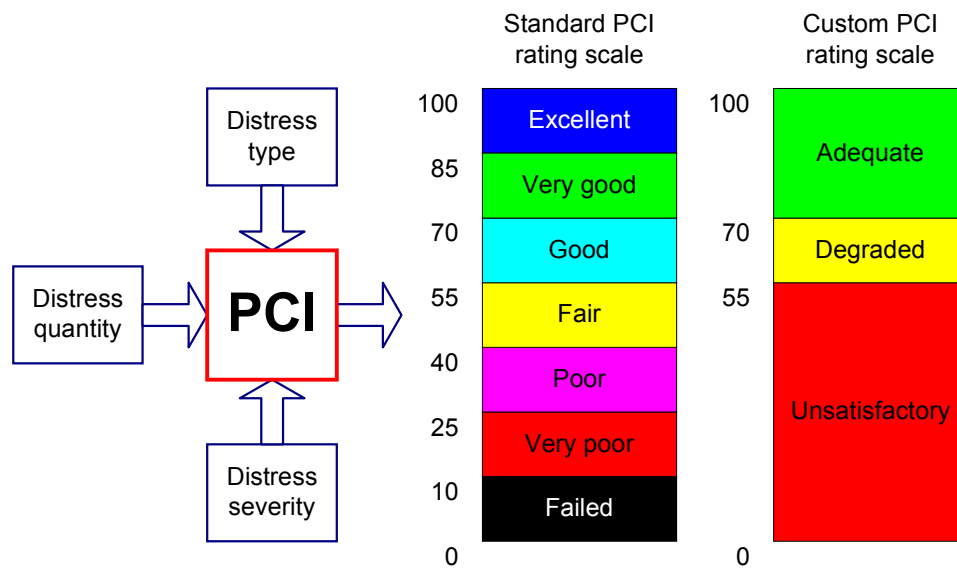


Fig. 3: Pavement condition index (PCI) ranges may be customized and used for reporting analysis results.

## Prediction modeling

The Prediction Modeling function in Micro PAVER helps identify and group pavements of similar construction that are subjected to similar traffic, weather, and other factors affecting pavement performance. The historical data on pavement condition can be used to build a model that can accurately predict the future performance of a group of pavements with similar attributes, figure 4.

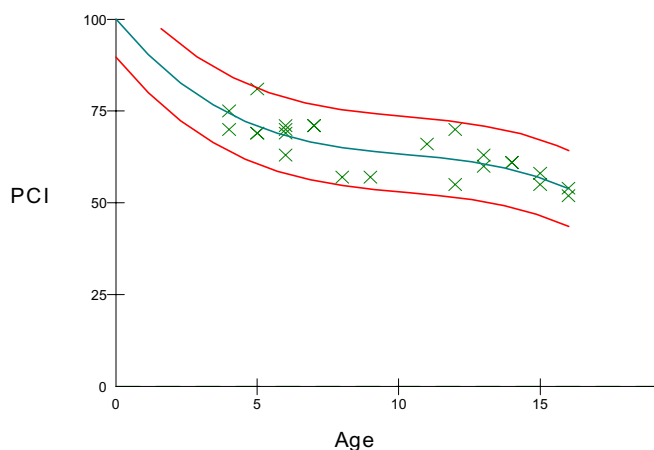


Fig. 4: Pavement “family” models can be developed to predict future pavement condition.

## Condition analysis

The Condition Analysis feature allows users to view the condition of the entire pavement network or any specified subset of the network. This feature reports past conditions based on prior interpolated values between previous inspections. It reports projected conditions based on prediction models. In Version 5.1 condition can be viewed on GIS maps in addition to tables and graphs, figure 5.

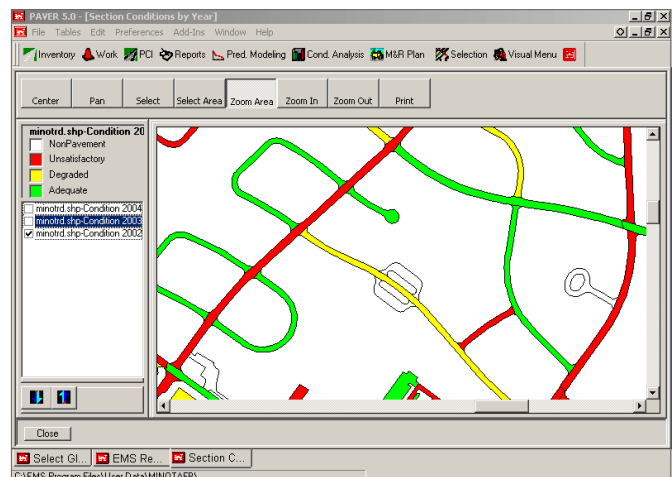
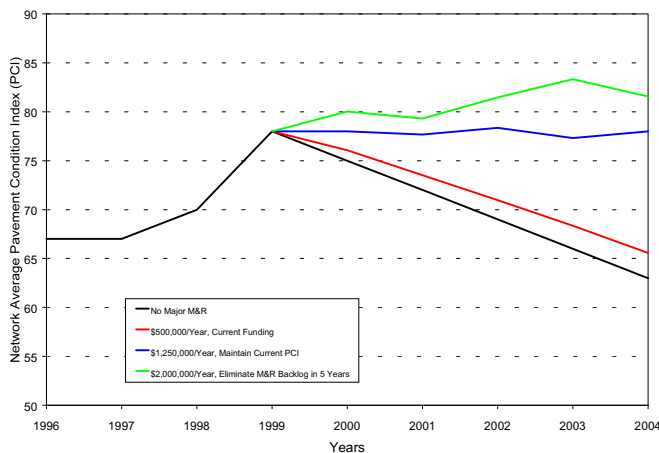


Fig. 5: Internal GIS can be used to display pavement condition and analysis results. For example, Condition Analysis and Work Planning outputs are displayed in GIS.

## Work planning

The Micro PAVER Work Plan is a tool for planning, scheduling, budgeting and analyzing alternative pavement maintenance and repair (M&R) activities. The M&R Plan uses basic inventory data combined with inspection information, maintenance policies, maintenance costs and predictions of future pavement condition. All factors used in determining the M&R can be configured to reflect local pavement management practices.

Version 5.1 provides the ability to determine budget consequence and budget requirements using an iterative process. This feature enables managers to develop a variety of funding scenarios to support their decisions, figure 6.



*Fig. 6: "Iterative" work planning enables users to determine how much funding is required over a given number of years to:*

- Eliminate the work backlog
- Sustain the current average PCI
- Attain and sustain an average PCI

## GIS assignment tool

New in Version 5.1, the EMS GIS Assignment tool links the PAVER data for individual pavement sections to GIS data. The GIS Assignment tool provides an internal 'point-and-click' interface to create, remove, or change the link between pavement sections and GIS map features.

Using the same visual layout as Selectors, figure 1, the tool dramatically reduces the time required to create or change the link between GIS and pavement data. This tool is designed to work directly with the same ESRI shapefiles that are used in PAVER's internal GIS capabilities.

## GIS interface

Micro PAVER includes an interface with Geographical Information Systems (GIS) for viewing and presenting data on maps. Micro PAVER data such as inventory, inspection, condition analysis, and work plan information can be viewed in ESRI, Inc. GIS software.

Micro PAVER Version 5.1 includes internal mapping capabilities that provide much of the same functionality without the use of external software. Users are now able to view GIS reports directly in Micro PAVER.

## Contact information

For more information about Micro PAVER, contact the distribution and support centers listed below:

### Non-DOD

American Public Works Association (APWA)

Phone: (816) 472-6100

Email: [paver@apwa.net](mailto:paver@apwa.net)

University of Illinois

Technical Assistance Center

Phone: (800) 895-9345

Email: [techctr@uiuc.edu](mailto:techctr@uiuc.edu)

### DOD

Engineered Management Systems

Center of Expertise

P.O. Box 9005

Champaign, Illinois 61826

Phone (217) 373-3326

Email: [paver@cecer.army.mil](mailto:paver@cecer.army.mil)

Website: [www.cecer.army.mil/paver/](http://www.cecer.army.mil/paver/)

## Micro PAVER sponsors

Micro PAVER development was funded by the following agencies:

US Air Force

US Army

US Navy

Federal Aviation Administration

Federal Highway Administration